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ON THE
VARIOUS FORMS
OF
LOSS OF SPEECH IN CEREBRAL
DISEASE.

(CONCLUDED.)

BY
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PHYSIOLOGICAL EXPLANATION OF THE PHENOMENA PRESENTED
IN APHASIA AND OTHER MODES OF DEFECTIVE EXPRESSION.

The theories that have been put forward in explanation of the 'aphasia' state are numerous, but owing to the various allied conditions not having been clearly distinguished from one another by some writers, and owing, as I think, to some others not having properly apprehended the kind and degree of relation existing between Language and Thinking, no small amount of confusion and contradiction is to be met with amongst these various explanations.

Omitting in this place a consideration of the views of the earlier writers on the various forms of loss of speech in cerebral disease, some account of which may be found in an interesting paper "On Aphasia," by Dr. Popham,¹ I will commence with the doctrine held by Professor Lordat.² This celebrated non-medical writer, who afterwards himself became aphasic, attributed the condition to a defect of co-ordination of the muscles which are used in the act of speaking—an explanation which, however, gives no account of the inability to write also exhibited by aphasies. It might with much more show of truth have been advanced as an explanation of that less common state which I have considered under the name *Aphemia*, though even then a lack of due co-ordination amongst the muscles of articulation should rather show itself in stuttering speech than in no speech at all. Dr. Mare Dax, in a paper read at the Medical Congress of Montpellier, in 1836, on "Lesions of the left half of the Brain coinciding with the loss of Memory of the Signs of Thought," indicates by the title of his essay that in his opinion the loss of speech is due to a loss of the memory of words,³ but as I have before stated when this is the case, thought itself would be stopped to a similar extent—a condition of things characteristic of *Amnesia* but not of *Aphasia*. In 1833, Dr. Osborne recorded the remarkable case which I have cited at p. 21, and he attributed the loss of the faculty of speech to "forgetfulness of the art of using the vocal organs." It must be remembered that his case was one of *Aphemia*, and, therefore, the explanation given was much more suitable for this class of cases, than when it is applied, as it has been in recent years by M. Baillarger, as an explanation of 'aphasia' in its old, general sense. For this combination of states, the explanation is obviously too narrow, as it affords no solution whatever of the difficulty that at the same time there is a loss of the power of expressing thoughts by writing. But whether Dr. Osborne's view be the correct one concerning his own case, entirely turns upon the ques-

¹ 'Dublin Quart. Journ. of Med. Sci.,' Aug., 1867.

² 'Rev. pér. de la Soc. de Méd. de Paris,' Dec., 1820, p. 317.

³ Reprinted in 'Gaz. Hebdom.,' 1865.

tion, whether we have a *memory*¹ of the muscular movements of the vocal organs concerned in speech or not. M. Broca, in his now celebrated memoir "*Sur le Siège de la faculté du Langage Articulé*," and in a subsequent communication,² after recording his two cases, proposed to give the condition he had been illustrating the name 'Aphémie,' the essential characters of which were according to him, not a forgetfulness of words, but a loss of the memory of the modes of muscular co-ordination necessary for the articulation of words, with integrity of the organs of association, and an unimpaired intelligence. But in both these cases of M. Broca (though he does not give due prominence to the fact), there was also an inability to write, so that they strictly belong to the ordinary category of Aphasia cases, and this explanation is, therefore, inadequate. Trousseau³ holds that "an aphasia individual suffers from verbal amnesia, so that he has lost the formulae of thought." He says again—"In aphasia, therefore, there is not merely loss of speech, but there is also impairment of the understanding. The patient has lost simultaneously, in a greater or less degree, the *memory of words, the memory of the acts by means of which words are articulated, and intelligence*. But he has not lost all these faculties in an equal degree, for the understanding is less injured than the memory of the acts for producing sounds, and this latter faculty less impaired than that of remembering words." In fact, Trousseau insisted again and again upon the assumed fact that, "in aphasia loss of memory plays the principal part." He saw that the explanation adduced by some that the defect consisted in a loss of the power of co-ordinating the speech movements, was inadequate since it failed to account, as I have just stated, for the coexisting inability to write, whilst he thought that the loss of the memory of words explained everything. "The patient does not speak because he does not remember the words which express ideas." But we have seen that thought is impossible without a linguistic symbol of some kind; in pure Amnesia there is, I believe, an arrest of thought in proportion to the degree of forgetfulness of words; but in Aphasia the thinking power is comparatively unimpaired, and, therefore, words must be recalled to the mind in some form, although the individual is incapable of expressing them either by speech or writing. Dr. Alexander Robertson⁴ saw this objection to Trousseau's theory clearly enough, and he contended that the defect could not be an amnesic one, because the individual retained the power of thinking, and, we think, by means of words. He considers the defect to be one of transmission—"that there is a

¹ 'Journal of Mental Science,' Jan. 1867.

² That is, a conscious memory, as opposed to an unconscious, organized memory (see 'Fortnightly Review,' Jan., 1869, p. 63).

³ 'Bulletins de la Soc. Anatom.' 1861, and in 1863.

⁴ Translation of "Lectures" by Bazire, Part i, pp. 266—273.

lesion of efferent fibres passing between the convolutions and the great co-ordinating centres, probably at some point of a line extending from the external frontal convolutions to the corpus striatum, so that voluntary motor impulses for the articulation of language cannot be transmitted. The *essential* morbid change is, therefore, *motor*, and not *mental*." He thinks also with Marcé that there are separate co-ordinating centres for the acts of speech and for the movements of the fingers, &c., in writing. And he adds:—"The two kinds of conductors may be side by side so that both will generally be implicated by the same lesion; but in some rare instances,¹ those escape which I believe to be concerned in the mandates for writing, so that the words present in the mind can thus be communicated." As will be seen further on, Dr. Robertson's view, so far as it goes, is a closer approximation to what I believe to be the correct one than any of the others have been, though he does not speak of the mode in which words do become nascent in the minds of aphasic individuals, or further develop his theory. Dr. Wm. Ogle,² as we have before seen, distinguished between amnesia and the ordinary condition of aphasia. The first form he considered under the name *amnemonic aphasia*, and the second under that of *atactic aphasia*.³

¹ Those which I have placed in the class *Aphemia*.

² 'St. George's Hosp. Rep.,' 1867, p. 94. Almost simultaneously, in his paper in the 'Dublin Quart. Journ. of Med. Science,' Aug., 1867, p. 4, Dr. Popham made a somewhat similar division, as far as names are concerned, though these names were applied quite differently. Thus, his (1) *Lethological or amnesic aphasia* appears to correspond to what I call Aphasia simply, whilst his (2) *Aneurial or ataxic aphasia* corresponds to what I have called Aphemia.

³ What precise signification Dr. Wm. Ogle gives to the term *aphasia* requires some explanation, as it is not, at first sight, quite clear from his paper having the title "Aphasia and Agraphia." He treats of mere loss of speech under the head of Aphasia, and of loss of the power of writing as a parallel state under the name of Agraphia—which name he was the first to introduce. But he does not seem to be aware that most writers understand by the term Aphasia, *some loss both of the power of speaking and of writing*. This may be inferred, since he makes a definite statement (p. 100) to the effect that "Aphasia and agraphia are usually combined together." Most writers would have implied in some way, however, that inability to speak (an *aphemic* symptom) and inability to write (an *agraphic* symptom) together constitute the condition of *Aphasia*. And throughout his paper it seems to me that Dr. Wm. Ogle, in using the word 'agraphia,' employs it as a designation for that inability to write which constitutes one of the factors of the Aphasic state. I also use it in this sense, though I then generally employ the corresponding adjective; but, in addition, I have proposed that it should be especially used as a class name, under which it will be well to range those cases in which agraphic symptoms only, or in the main, are presented. It seems to me, therefore, that if the title of Dr. Wm. Ogle's paper had been "*Aphemia and Agraphia*," and if it had been explained that under this title he did not propose to treat of 'Aphemia' or of 'Agraphia' as class conditions, but rather of aphemic and of agraphic symptoms, the component factors of what Trousseau and most others call *Aphasia*—there would have been less room for any misunderstanding concerning his own views, or chance of his misconceiving the views of others.

I make these remarks because, I am sorry to say, it seems to have occurred to Dr. Wm. Ogle that, in the note above referred to, I have treated him with unfairness, by not recognising that he had made previously the same class distinction which I there propose.

With reference to the latter condition, he writes—"Not only must we remember words, but we must also remember *how to say them*." Should this latter memory fail, he says, "we have a second form of aphasia which for distinction we may call *Atactic Aphasia*, the loss of speech being due to the want of co-ordinating power over the muscles of articulation." Dr. Wm. Ogle here seems to me to assign, in consecutive pages, two reasons which are totally distinct from one another, in explanation of the same morbid condition—to both of which, however, I have already alluded. Dr. Wilks¹ is a firm believer in the doctrines of Dr. Moxon,² that the left half only of the brain is educated for the carrying on of the acts of speech; he considers that speech is essentially a motor process, and that the defect by which it is lost is also a motor defect. He also believes that we cannot think "without the larynx and muscles of vocalisation passing in the imagination through a kind of inarticulate speech," a view somewhat similar to that of Professor Bain, and, as I think, open to the same objections.³ His views in part seem to be not very different from those of Dr. Robertson which I have just alluded to, and they seem also closely to resemble those of Dr. Hughlings Jackson with regard to the connection between thought and language. Dr. Jackson⁴ believes that in aphasia the power of voluntary expression is principally affected; that the defect is for the most part a motor impairment. He says also, "we think by help of words—*i. e.*, by acquired arbitrary signs—and these are motor processes." Seeing that the person can understand when we speak to him, he says that though speechless, the patient is not wordless, since verbal signs may be developed in him by our talking, though he cannot initiate verbal movements. He adds:—"The words lie I imagine on the right side. It may, however, be said, that the internal reproduction occurs on the left side of the brain, and that the patient *does initiate* verbal movements, and would actually reply if the damage near the corpus striatum did not prevent words getting out." It appears to me that some lack of clearness exists in this statement, which seems in part attributable to the view that Dr. Jackson takes concerning the way in which words become nascent when we employ them in thought. As I believe, they are not "motor processes" in such a case, but simply revived auditory impressions. In a paper on the "Physiology of Language," read before the British Association

¹ 'Med. Times and Gaz.,' Jan. 18th, 1868.

² This 'Review,' April, 1866.

³ It is fully admitted that the two phenomena do very frequently occur together; but then this coincidence seems to be nothing more than might have been expected, if we consider the extreme frequency with which processes of thought do find articulate utterance throughout every day of our lives. I doubt the necessity of this suppressed articulation in a process of silent thought, and regard it only as a superadded phenomenon which is very likely to occur.

⁴ 'Med. Times and Gaz.,' Sept. 26th, 1868.

at Norwich this year, Dr. Jackson ranges the cases presenting defects in intellectual language under two principal classes: Class I, corresponds with what I have spoken of as *Aphasia*; and Class II comprehends the various *Amnesic* defects in which a lack of co-ordination is exhibited, cases in which there are "*plenty of words, but mistakes in words*"—a division practically corresponding with that of Dr. Sanders and of Dr. Wm. Ogle.

Dr. Maudsley¹ has lately, in an interesting and original communication, expressed more at length and very strongly certain views with regard to the physiology of Thinking, so that it will be necessary for me to give these a more thorough consideration. According to Dr. Maudsley there are two essential factors in intelligent speech, the idea and the motor act, and too great importance has been generally attached to the influence of names or words in thinking. He says: "the faculty or power of co-ordinate movement exists in the proper motor centre, and may be excited by the idea descending from the cerebral hemispheres above." This stimulus releases the movement which is latent (or potentially organised) in the centre; and the movement, in the case of speech, results in the production of the word or articulate sound answering to the stimulating idea. So far it will be seen that, according to Dr. Maudsley, thought is a process of ideation taking place in the cerebral hemispheres without the intervention of language or linguistic symbols, which latter he seems to regard as only the physical expression of the accomplished ideation, resulting from the subsequent stimulation of the motor centres. To this extent, therefore, Dr. Maudsley seems in opposition with the great majority of thinkers, who believe that thought itself, the actual process of ideation, cannot be carried on without the constant intervention of linguistic symbols of some kind. Perhaps seeing the difficulty of maintaining his former position, Dr. Maudsley almost immediately adds—"But there is another most important consideration, which has been almost entirely neglected, but which is of the greatest moment, namely, the influence which the motor centres, when functionally excited, have, not only on the nerves which go from them to the muscles, but on the higher cerebral centres with which they are connected by intercommunicating fibres. The faculties which have been organised in them by education may act, and probably always do act, upwards as well as downwards, and, indeed, may act upwards without acting downwards. So acting on the supreme cerebral centres, and thus declaring themselves in consciousness, they become what have been called *motor intuitions*, recollections of movement associations." Now the postulation of these "motor intuitions" does not seem to me to make Dr. Maudsley's doctrine a more tenable one, neither do I see how it is possible that these can "furnish us with the conception of the design of a movement before it is made ;

¹ *Concerning Aphasia.* 'Lancet,' Nov. 28th and Dec. 5th, 1868.

that is, in the case of speech, with the word before it is uttered." For the motor centre has first to be excited (by "the idea descending"), and when excited the centre acts simultaneously in both directions—downwards, in order to call into play the requisite combined muscular action for the production of the corresponding articulate word, and upwards to the cortical substance, so as to convey to the mind the impression of the word which is *at that very time being uttered*. Therefore, the word never intervenes in the process of thought at all, and any intimation of *its* existence reveals itself in consciousness only at the moment when it is being actually converted into a physical mode of expression. In fact, these "motor intuitions" seem to me in no way to differ from the impressions derived through the so called "muscular sense"—they represent what Professor Bain so fully describes as the "feelings of muscular movement"¹—and I have elsewhere² endeavoured to show why these cannot be so instrumental in the process of thinking as they have been deemed to be by some. But we must endeavour to get at Dr. Maudsley's meaning a little more fully. Somewhat further on he says:—"It is, therefore, misleading to say we think by means of names. We think by the ideas which names call up in the mind, and by the motor intuitions through which the ideas get definite expression in appropriate movement." Now, taking the latter part of his sentence first, we have already seen that the motor intuitions cannot so much assist in the evolution of thought since they are only the accompaniments of what is or might be, the physical expression of actually accomplished thought. Hence Dr. Maudsley must rely mainly upon the first part of this sentence: "We think by the ideas which names call up in the mind," he says, and so far I thoroughly agree with him. But I am compelled to ask him, how is it (in a process of silent thought) that these names which are to call up the ideas reveal themselves to his consciousness? I say they become nascent in my consciousness for the most part as remembered sounds, but Dr. Maudsley does not even hint at any such mode of revival of words; indeed, from a sentence which follows almost immediately, it would seem that he does not consider words intervene in thought at all except as motor intuitions. He says:—"What we really have as the essential factor in the mind is not the word but the motor intuitions denoted by the word." Now as I have previously shown, if we take the mode of origin of the motor intuition to be such as Dr. Maudsley describes, namely, an upward response to an ideational stimulus—which may or may not be synchronous with a

¹ It may be seen, however, from the next section of Dr. Maudsley's paper that he does not seem to regard these as merely different names for the same phenomena. But though speaking of them as if distinct, he does not attempt to show how they differ from one another.

² Art. on "The Physiology of Thinking" (loc. cit.).

downward stimulus to museles issuing in articulate speech; then, praetieally, it must be admitted that thinking does habitually take place without the aid of language. And the only other alternative, as it seems to me, offered by the argument is, that these "motor intuitions" actually take the initiative in a proecess of thought (since *they*, he thinks, are really the mental names which are to call up the ideas); but since these motor intuitions, by Dr. Maudsley's own showing, must have their origin in and proceed from the motor eentres, this would be to transfer some of the most eminently mental funetions, such as *recollection*, from the eortical substance of the hemispheres to the corpora striata and other lower motor eentres, and also to make these bodies always take the initiative in proecesses of thought. Few, we think, would be inclined to admit this doetrine. I will only add that Dr. Maudsley thoroughly rejeets the doctrine of Broca, and he thinks it most probable that the Aphasia eondition is principally due to a lesion of some part of the motor eentres, or of their eommunica-tions with the supreme eentres; whilst he also suggests that some of the phenomena of Amnesia may be explained on the supposition of a partial loss of the museular sense.

Dr. Bateman,¹ in the last section of his paper, says he prefers using the word Aphasia, as a designation for "all eases where speech is abolished or suppressed, from whatsoever eause," fully reecognising, however, that this neecessitates "divisions and subdivisions in which all the shades and degrees of the affection may be included." He thinks a person may become aphasic in two priniepal ways, "either by losing the memory of the symbols of language, or by forgetting the meehanical movements necessary to give expression to such symbols." Lastly, Mr. Robert Dunn, in a paper read at the late meeting of the British Assoeiation,² ably insists upon the different situations in which lesions of the hemispheres may give rise to loss of speech, and he also, with Dr. Maudsley and others, rejeets the notion that cerebreal loss of speech does not result from lesions of the right half of the brain.

By this time the reader will pretty well have gathered in outline what my own views are coneerning the phenomena exhibited by persons suffering from the various defeets in thinking, and in the power of expression which I have classed under the heads of, 1. *Amnesia*; 2. *Aphasia*; 3. *Aphemia*; and 4. *Agraphia*. These may now, however, be stated more explicitly; and in order that such explanations may be more fully understood, it will be necessary to recall the reader's attention to views which are stated more in detail elsewhere³ coneerning the localisation of function in the cerebreal hemispheres.

It seems almost certain that impressions from the organs of sense

¹ 'Journ. of Ment. Science,' Jan., 1869.

² Reprinted in 'Brit. Med. Journ.,' Jan. 30th, 1869.

³ 'Journ. of Mental Science,' Jan., 1869.

to the perceptive centres in the cerebral hemispheres travel along definite routes, although we may be more or less ignorant as to what these routes are, and also as to the extent and situation of the ground occupied in the cerebral hemispheres by the several 'perceptive centres.' We are ignorant, also, as to how far these centres exist separately, in areas distinct from one another, or how far and in what way they are interblended with one another. We may be sure, however, that such centres do exist somewhere, and are in connection with afferent fibres, bringing them into connection with ganglionic masses, existing nearer the base of the brain and the medulla oblongata; that upon these lower ganglionic masses sensory impressions travelling along their respective nerves impinge, and that each there undergoes that first modification of the series which is to convert the primary stimulus into a distinct Perception, after the final action of the cells of the cortical substance in the corresponding perceptive centre. And because strong associations grow up between impressions of one sense and those of another, so that *e.g.* sound impressions will recall to mind associated visual impressions, and the reverse, so we are entitled to infer that abundant communications exist, not only between these two centres, but between any single centre and all the others. As I have before stated, I believe that words are revived (during thought) in the auditory perceptive centres, and that from these centres the fibres issue along which the volitional stimulus must pass in order to translate the thought into articulate speech. It seems almost certain, also, that these efferent fibres in their downward course to the centres in the medulla oblongata, must pass through the corpora striata. In writing, I believe, the preliminary thought is carried on in the same way by the revival of words as auditory impressions, and that (by virtue of an association which was gradually matured whilst the child was learning to write) these revived sound impressions automatically revive the corresponding visual impressions of the letters composing the words, so that the motor stimulus which is to incite (automatically for the most part) the muscular movements necessary for writing, emanates principally from the visual perceptive centre and travels along a distinct set of fibres issuing from this, just as it is presumed those for speech do from the auditory perceptive centre. There is every reason to believe that these fibres also pass through the corpus striatum.

Now, before going into further details, let us look at the explanation of the four different kinds of defect with the aid of these views. In *Amnesia* there is an inability to recall words—*i.e.* they cannot properly be revived in the auditory perceptive centres, and there is an almost proportional impairment of the thinking power. Now, it would appear that this condition must be due either to some abnormal state of the auditory perceptive centre itself, where

words have to be revived, or else to some defect in those portions of the cortical grey substance which have to do with the exercise of that marvellous power of voluntary recall of past impressions to consciousness, which occurs in the process of *recollection*. In this condition we obviously have to do principally with defects of the cortical grey matter of the hemispheres, rather than with defects of afferent or efferent fibres connecting this with lower-nerve centres. But in *Aphasia*, as we have seen, the individual is able to think and understand what is said to him, though he cannot express himself either by speaking or reading. Now, we can well imagine that this would be precisely the condition of a person in whom those efferent fibres are damaged (and functionally inert) along which the motor stimuli are wont to pass that primarily incite those combined muscular contractions necessary, for speech on the one hand, and for writing on the other. There being no notable injury to the cortical or convolutional grey matter the individual can carry on processes of thought as before, and the afferent fibres not being damaged he can understand what is said to him. But he cannot translate his thought into articulate speech or into written language because the first part of the path along which the motor stimulus would have to pass, in order to incite the necessary combined muscular movements, is broken up or damaged. A lesion of both these sets of fibres in any part of their course between the cortical grey matter and the corpus striatum, or in this body itself, would, therefore, produce such a result. Just so, a lesion of either one of these sets singly would produce the corresponding simple condition of which Aphasia is compounded: thus, if the set of efferent fibres emerging from the auditory perceptive centre, having to do with the incitation to the muscular acts of speech, be torn across in any part of their course, we should have, I think, the anatomical explanation of *Aphemia*, in which, though the individual is able to think and write, he cannot speak; whilst, if the set of fibres emerging from the visual perceptive centre (along which, as I think, pass the motor stimuli that incite the muscular movements for writing) be alone damaged, in any part of their course between the convolutions and the corpus striatum, we have similarly the anatomical explanation of *Agraphia*, in which the individual can think and can speak, but cannot express himself in writing.

Assuming, for the present, that these explanations are not improbable, let us now see whether the various other characteristics presented by persons in the conditions above described accord equally well with the views above announced; and if they do, then must this accordance be taken, I think, as additional evidence in favour of the truth of what has been advanced.

It is not at all to be wondered at that *Aphasic* individuals, so long as their general intelligence is not notably diminished, should have the power of expressing themselves to others by *signs*

and gestures, even though they have lost their command over the more definite modes of expression. For, although distinctions have been drawn between the loss of articulate speech, on the one hand, and the loss of the so-called "general faculty of language" on the other, it is very questionable whether this is a desirable way of stating the distinction. In the latter case, there is, necessarily, a loss of this supposed faculty, since a general weakening of the whole intellect to an extreme degree includes, of course, as one element, a loss of the power of Naming; which power, as Herbert Spencer has shown, depends upon the integrity of memory and the capability of performing the simplest acts of inference. And whenever the intellect is extremely weakened by a very severe cerebral lesion, the individual does lose this power of naming, and therefore it seems somewhat unfair to speak of a loss of the general faculty of language in such a case, when it should rather be stated more broadly and more simply that his memory is very much impaired, and that he is incapable of performing even the simplest acts of reasoning. In such cases the power of expression, even by signs and gestures, would be almost entirely absent, but we can well understand that in typical cases of Aphasia (where the memory is good and the intellect only very slightly impaired), although the individual may have lost the highly specialised power of expressing himself by articulate speech or writing, he may still show, so far as possible, the thoughts that are within by aid of emotional demonstrations and by signs. These are modes of expression common to man and the lower animals, and as such they have a far deeper and more organic root in his nature, so that they are, therefore, far less likely to be annulled by slight causes.

Emotion,¹ too, rather than Will, is the motive power inciting to action in the lower animals, in children, and in weak-minded people; and it is only as we rise in the scale of intelligence that we gradually find the power of mere will or volition becoming stronger, and progressively dwarfing the extent of action which is more directly prompted by feeling. Still the natural power of emotion remains, and its dictates are so all-powerful when aroused, even in man, as not unfrequently completely to conquer any mere volitional strivings which may be opposed to them—as may be seen when a person is absolutely compelled to give way to laughter, even though he make the strongest efforts to restrain it, and all prudential reasons may be against the indulgence.² If this is the case, and if we see that Aphasic individuals have the power, sometimes, by a

¹ Using this in its broadest sense, so as to include the various appetites.

² Although I make this distinction here between action prompted by emotion and that prompted by volition, I am only using these words in their ordinary acceptation, and am fully alive to the fact that the two kinds of action merge insensibly into one another. Volition is a kind of sublimation from, and highly specialised form of, an ordinary emotional stimulus.

strong volitional effort, of uttering words which they cannot afterwards repeat, then it is not to be wondered at, I think, that these same individuals should, under the influence of strong emotion, be able to swear, or utter such other expletives as they may have been accustomed to make use of, when in similar emotional conditions, before they were rendered aphasic.

The emotional stimulus being a much stronger one than the volitional—a thing of higher tension—it forces its way along channels and against resistance which the volitional stimulus alone is utterly unable to overcome; for though the individual may swear or utter such an expletive as “Oh, dear!” at the incitation of emotion, he is quite unable to repeat the same phrase by any volitional effort that he may make, a few moments after, when the passion has subsided. I cannot, therefore, altogether agree with Dr. Hughlings Jackson, when he says, in explanation of this peculiarity of Aphasics, that their ability to swear depends upon the fact that there are two distinct kinds of language, emotional and intellectual, of which the latter only is impaired in the aphasic condition. Although it may be perfectly true, as Herbert Spencer says, that “cadence is the involuntary commentary of the emotions on the intellect,” and that swearing, so far as its *effect* is concerned, does, as Dr. Jackson says, “belong to the same general category as loudness of tone and violence of gesticulation:” still I do not think he is correct in stating that “swearing is, strictly speaking, not a part of language.” Seeing that oaths and expletives do consist of actual articulate words, they must be called up and evolved by precisely the same physiological methods as are concerned in the enunciation of any more strictly intellectual proposition. The sole difference, in my opinion, is that, in the one case the words are evolved, in spite of opposing difficulties, by the superior force and energy of an emotional stimulus; whilst in the other they often fail to be produced under the influence of the more slender and feebler stimulus of volition.¹

¹ Dr. Gairdner's explanations ('Trans. of Philosophical Society of Glasgow,' 1866) do not seem to me to be applicable to the cases which I class under the name *Aphasia*, though they are excellent if applied to the elucidation of the more or less involuntary utterances of *Amnesic* patients. He says, “The explanation that seems to me, amid the confessedly great difficulties of the subject, to come as near as any to a satisfactory one of these and other apparent eccentricities of utterance in the aphasic is, that the words which are most readily spoken are always those which are prompted, not by external observation and deliberate volition, but by some internal association of ideas, the words being not so much deliberately spoken as set free (so to speak) by the fluctuating waves of emotion or of memory, which may be conceived to act upon the old-established habits and latent capacities of the brain, very much as one wholly unskilled in music, or deprived for a time of his musical faculty, might let loose the tones of a barrel organ, without any direct personal cognisance of the music he is playing or the precise combinations of movement he is calling into action. In other words, the aphasic is able to pronounce those words, and those only, that are *called out of him*, as it were, by trains of association, of which he is only partially

With regard to the case which Dr. Bateman has mentioned,¹ where the woman *mimicked* and repeated everything that was said, although unable to utter a single word spontaneously, it seems to me that it and similar cases cannot belong to the Aphasic class; they are rather instances of an extreme form of amnesic defect, in which the power of voluntary recall, or recollection, of words is wanting. When the impressions are, however, excited in the auditory perceptive centres, then these are capable of giving rise to the necessary motor stimulus which translates itself into articulate speech. The defect could not be, as in Aphasia, due to an impediment to the passage of the motor stimulus; and this supposition seems to derive confirmation from a consideration of the case of the artillery officer recorded by Dr. Hertz (p. 11), who, it is said, "was able to articulate distinctly any words which either occurred to him spontaneously, or when they were slowly and loudly repeated to him. He strenuously exerted himself to speak, but an unintelligible kind of murmur was all that could be heard. The effort he made was violent, and terminated with a deep sigh. On the other hand, he could read aloud with facility." This also seems to me a defect of just the same kind. He could utter a word which came to him spontaneously, and he could repeat words uttered before him; but he could not himself voluntarily revive the sounds of words in his auditory perceptive centre, so as to be able to recollect them and speak them. Similarly, with a book before his eyes, visual impressions were recognised; these revived their corresponding auditory impressions, and the volitional channel between this centre and the corpus striatum being uninjured, the motor stimulus passed over for the articulation of the revived words. The remarkable case recorded by Dr. Hun (p. 12) differs from this, but still seems to resemble it much more closely than it does ordinary cases of aphasia; the lesion was probably rather one of the grey matter than of motor fibres issuing from this.

Most aphasic patients can *understand perfectly what is said* to them, and can follow and feel interested when they hear others read aloud. In these cases we may presume that the afferent fibres connecting the auditory centres of the medulla with the auditory perceptive centres of the cerebral hemispheres, and also these latter centres themselves are intact, so that the spoken sounds revive their

conscious at the time, acting upon forms and modes of expression which he may have learned to blurt out in the presence of similar associations long before his disease; while, on the other hand, he is utterly unable to select deliberately an appropriate term from among many inappropriate, and to apply it with free rational choice, and a corresponding determinate effort of volition, to the expression of a predetermined idea then and there accurately defined in the consciousness" (p. 19). All this applies perfectly to an *Amnesic* individual who has lost the power of voluntarily recalling, or recollecting words, but not to one *Aphasic*, who, when the word—even the simplest—is suggested to him, is utterly unable to pronounce it.

¹ 'Journal of Mental Science,' Jan., 1869, p. 501.

accustomed impressions in the hemispheres, these being perceived as words symbolic of things or ideas, which, being duly appreciated by the individual as they are conjured up, suggest to him the thoughts which they are intended to convey. In certain of the severe cases of Aphasia, however, as in that by Dr. Bazire, recorded at p. 16, and in Dr. Gairdner's case,¹ it is distinctly stated that the patient either did not gather at all, or with difficulty and imperfectly, the import of words when he was spoken to, though he could be made to understand, with the utmost readiness, by means of signs and gestures. Must we not suppose that in such a condition either the communication of the afferent fibres with the auditory perceptive centres is cut off, or that this centre itself, in which the sounds of words are habitually discriminated and associated with the things to which they refer, is more or less injured? In either of these cases, though the sound is not appreciated as a *word* having its definite meaning, we must not expect that there would be deafness: the sound would be still heard as a *mere sound*, only it does not call up that superadded intellectual discrimination, by the ingrafting of which upon it it can alone be made to serve as a symbol of thought. Hence the individual does not adequately comprehend when spoken to, though he may be quite capable of receiving and appreciating fully the import of signs and gestures which make their impression upon his visual perceptive centres.

Some of these patients can *read to themselves*, and some cannot. In those who can we must suppose the afferent fibres going to the visual perceptive centres, these visual perceptive centres themselves, as well as the auditory perceptive centres and the fibres connecting the two, uninjured, and we then have the structural conditions necessary for enabling the individual to understand what he reads. As we have before seen, in the process of learning to read, the person has first learned to speak and to understand speech, by the gradual growth and strengthening of the primary memorial association between things and their names or sounds: then there is slowly superadded to this an additional association between certain visual impressions, made by the printed or written symbols of words, and this previous compound association, till at last the mutual association becomes so strong, that any one being given to consciousness—either the thing, the name, or the written symbol of it—each is capable of calling up automatically the other two. So that in reading, as I imagine, the visual symbols of words call up or revive automatically (by means of the connecting fibres between the two centres) the words as sound perceptions, and by the aid of the two impressions combined, but principally, I am disposed to think, by means of the second (although it obtrudes so little upon our consciousness)

¹ 'Glasgow Med. Journ.,' May, 1866, p. 13. and 'Trans. of Philos. Soc. of Glasgow,' 1866.

we gather the import of what we read, by the realisation of the third term of the association. Here, of course, the views I hold differ from those expressed by Prof. Bain, because I cannot agree with him as to the way in which words become nascent in a process of silent thought. He says—"It is not necessary to read aloud in order to transfer the work from the eye to the voice—a mere whispered or muttered articulation—a mere ideal rehearsal will become coherent. In fact, I believe we retain written language by the help of both methods, or by a combination of trains of symbols, as seen by the eye, with trains of symbols rehearsed by the voice." He thinks such a transference, therefore, "from the eye to the voice" necessary for the appreciation of printed or written language; but if it were so, reading ought to be impossible to Aphasies, since this is just the very transference which could not take place; and, in short, if we accept Prof. Bain's view with regard to the way in which words become nascent in consciousness—that "a suppressed articulation is, in fact, the material of our recollection"—then it seems to me a matter of the utmost difficulty for us to explain the aphasic condition and the individual's perfect ability to think whilst his powers of articulate speech have vanished.¹ It is this difficulty with which Dr. Hughlings Jackson has had to contend, since he has accepted Prof. Bain's views. In attempting to explain what we may meet with in another Aphasic individual, viz., that he is unable to understand what he reads, Dr. Jackson says—"He cannot *voluntarily* repeat the words internally," though, "if we take the book and read to him he understands, so that an automatic reproduction of words is possible." Now, in both these cases, I think, the reproduction of words would be automatic, in the one case immediately, by an impression on the sense of hearing, and in the other secondarily, after a primary impression upon the sense of sight. And where the individual cannot read, I am inclined to think this must be owing either to some lesion of the afferent fibres to the visual perceptive centre, of the visual perceptive centre itself, or of the communications between the cells of this centre and those of the auditory perceptive centre. If lesions existed in either of the first two situations the visual impression could not receive its intellectual elaboration, and, consequently, it could not call up its associated sound (word) in the auditory centres, and hence no meaning would be conveyed by the hieroglyphic marks of the printed or written pages. They would be to the person mere meaningless strokes, just as we have assumed that if similar defects existed in the auditory perceptive centres, or

¹ Professor Bain himself says—"It is not very easy to produce any instance to show, on the other hand, that a series of actions can be repeated mentally and not bodily; for as the mental actions are performed in the same circles, it usually needs only a volition, often the removal of a restraint merely, to bring them to the full length of actuating the muscles." ('Senses and Intellect,' third edition, p. 346.)

in the afferent fibres with which they were connected, the individual could not appreciate the meaning of spoken words—these would be to him mere sounds. Unless on some such view as this, how can we account for the fact, so often met with—and of which we have a striking example in Trousseau's case (p. 17)—that an aphasic individual, otherwise exhibiting a marked degree of intelligence, is unable to point out individual letters, even when these are of the largest size.¹ If the communications between the visual and auditory perceptive centres were injured, there probably would be, at the least, a great impairment in the power of comprehending written language.

Then it is often found that, although the individual *cannot write* a word of his own accord, or, perhaps, at the most, only his own name, he *can copy* what is written for him, and he can often, as Dr. Jackson has shown, with a printed copy before him, transfer the words into the ordinary characters of writing. In this case, he may or may not understand the meaning of what he transfers, according as he is capable of reading to himself or not. Dr. Jackson thinks it is necessary that in this process the calling up of the "verbal sign" should intervene, and I think so too, if the individual comprehends what he copies, though we differ in opinion as to the nature of this "verbal sign." But I can quite conceive that an individual might have this power of transference to a limited extent, even though he did not understand the meaning of what he was copying, and in whom, therefore, the proper verbal sign was not called up. He would copy letter by letter, and simply effect the interchange mentally (by an operation performed in the visual perceptive centre) so as to substitute the written for the printed symbol. When persons are able to copy in this way words from printed into written characters, it seems to me a process comparable with the power which certain other aphasic individuals have of repeating sounds that have been previously uttered before them; and in both cases it seems to show that we have not to do with a pure case of Aphasia in which both of these modes of expression are no longer possible, but rather with one of a mixed nature, partly aphasic and partly amnesic. The individual cannot recall voluntarily the written characters for words; but when he sees them, or even printed characters, the impressions so revived in his visual perceptive centres do enable him to give rise to the motor stimuli necessary for writing them. His

¹ Since the above passage was written I have had under my care a patient who had been hemiplegic on the right side and aphasic, but who had in great part recovered. She could speak fairly well, she could understand perfectly what was said to her, and when passages of a book were read aloud to her, but could not read a single word herself: the *sight* of the words seemed to convey to her no meaning, and neither could she pronounce a single word from looking at it alone, though she did this at once after she had *heard* it pronounced. She could even scarcely point out single capital letters.

power of voluntarily recalling, or of recollecting, the written characters, is, therefore, at fault, rather than his power of executing the movements necessary for writing them. Seeing that such a condition may exist, it is also perfectly comprehensible that so long as the due communications exist between the auditory and visual perceptive centres, individuals who cannot write anything spontaneously may write when words are dictated—the auditory impressions, in these cases, automatically reviving the corresponding visual impressions which are capable of giving rise to the muscular movements necessary for translating them into written characters. Have we not here an explanation of the cases cited by Dr. Osborn and Mareé (pp. 13, 14)? Only in these cases we must suppose that in addition to their defective power of recalling impressions which had been made upon their visual perceptive centres, there was also some lesion of the *afferent fibres* pertaining to these centres, since, in both cases, impressions made directly upon their visual organs received no intellectual elaboration and were not comprehended. These individuals could not read, neither could they even comprehend their own writing—which they must just before have executed under the influence of impressions, which, having first received their intellectual elaboration in the auditory perceptive centres, must then have aroused the corresponding portions of the visual perceptive centre, and so allowed the proper motor stimuli to issue.

But these are quite exceptional conditions: the rule is that the individual who can copy more or less cannot write at all from dictation. In copying, as Dr. Jackson points out, the patient transfers letter by letter in a slow way, so that we have a mere imitative reproduction carried on through the instrumentality of the visual perceptive centre alone. But in writing from dictation, the process is a much more complicated one; the individual must be able to hear the words as well as realise the mental elaborations of the sounds, and in this process the impressions must be capable of calling up corresponding ones in the visual perceptive centres before the motor stimulus could issue for the execution of the writing. It is obvious, then, that the power of writing from dictation may be abolished by an imperfection in the communications between the auditory and visual perceptive centres, by a lesion of these latter centres, or of the efferent fibres proceeding from them to the corpus striatum. The latter condition is what I have presumed to exist in a typical case of Aphasia, where the individual knows what he wants to write just as he knows what he wants to speak, but finds himself, nevertheless, as unable to write a single word as he is to articulate the same. In these cases, too, the persons are quite unable to copy—they cannot write a single letter if this kind of lesion is extensive, and all attempts end in the marking down of mere meaningless strokes. But if their efferent fibres are intact, and there is instead a moderate lesion of the visual

perceptive centre, or of the fibres connecting it with the auditory perceptive centre, then the individual might be able to copy, to transfer from printed to written characters, or even to write after a fashion with more or less mistakes of spelling and substitution of wrong words. There would then be amnesic and inco-ordinate defects in writing, rather than an absolute inability to write.¹

These explanations accord exactly with the varieties met with in the *Agraphic* condition. Thus, in the case recorded by Dr. Wm. Ogle (p. 24), there was a notable amnesic defect of speech, though the patient could not write a single letter; and here we may presume that whilst there was an injury of the grey matter of the auditory perceptive centre in which words are revived, there was also an injury to the efferent fibres proceeding from the visual perceptive centre (in some part of their course between it and the corpus striatum) which brought about the inability to write even simple letters.² In the case of the woman, recorded by Dr. Jackson (p. 24), there was a smaller amount of the same amnesic defect of speech, and an inability to write any single word—even her own name—with any approach to accuracy, although the penmanship and shape of the actual letters was fairly good. Here I think there must have been some grave defect either in the visual perceptive centre itself, or else in the fibres connecting it with the auditory centre, whilst in Dr. Jackson's other patient (p. 25), who made mistakes in words and spelling, but still wrote infinitely better than the last patient, there must have been a slighter defect of the same kind. And in the case which I have recorded (p. 26) we can, I think, best explain the phenomena he presented by supposing lesions of these same commissural fibres to exist, either alone or combined with lesions of the visual perceptive centre itself. In this case, the man presented remarkable variations in his power and mode of writing, but then his general condition must be borne in mind, as it is such a common occurrence to observe in insane persons remarkable differences in their mental state at different times. It is worthy of note that in this case as well as in that of the government clerk recorded by Dr. Jackson, the mode of spelling was almost entirely in accordance with the mode of writing, and this is what we might have expected, I think, if we consider how it is that a child learns to spell, viz. in very great part by conning, and, by dint of frequent repetition, impressing

¹ I cannot understand Dr. Jackson's explanation of the inability of these persons to write from dictation. He says, "Although the dictated words do revive verbal signs, these automatically revive next, not images of *writing* letters, but concepts. If writing is to occur there must be a *further stage*. They would have to revive voluntarily the words, in order that he may transfer them to paper. * * * * When he copies verbal signs are revived too, but these develop merely the visual images of calligraphic marks."

² There may have been, also, some lesion of the visual perceptive centre itself, since this man was quite unable to spell by picking out separate letters, which he ought to have been able to do if the centre itself had been uninjured.

upon its mind the visual appearance and collocation of letters as given in a spelling book. Still, before one had thought all this out, it was very puzzling to hear a man when asked to spell "cat" say deliberately "eandd," and then immediately pronounce the word as though he had spelt it "cat." Visual impressions obtained by reading and learning to spell do appear, also, to be called in as accessory aids when memory does not easily revive a wished-for word in the auditory perceptive centres. Thus, a most interesting case has been recorded by Dr. Graves,¹ in which, as he says, there "was a remarkably exaggerated degree of the common defect of memory observed in the diseases of old age, and in which the names of persons and things are frequently forgotten, although their initials are recollected."

The man was a farmer, fifty years of age, who had suffered from a paralytic attack, from which he had not recovered at the time of observation. The attack was succeeded by a painful hesitation of speech. His memory was good for all parts of speech except noun-substantives and proper names; the latter he could not at all retain. This defect was accompanied by the following singular peculiarity:—he perfectly recollected the initial letter of every substantive or proper name for which he had occasion in conversation, though he could not recall to his memory the word itself. Experience had taught him the utility of having written on manuscript a list of the things he was in the habit of calling for or speaking about, including the proper names of his children, servants, and acquaintances; all these he arranged alphabetically in a little pocket dictionary, which he used as follows:—if he wished to ask anything about a cow, before he commenced the sentence he turned to the letter C, and looked out for the word "cow," and kept his finger and eye fixed on the word until he had finished the sentence. He could pronounce the word "cow" in its proper place so long as he had his eyes fixed upon the written letters; but the moment he shut his book it passed out of his memory and could not be recalled, although he recollected its initial and could refer to it when necessary. He could not even recollect his own name unless he looked out for it, nor the name of any person of his acquaintance; but he never was at a loss for the initial of the word he wished to employ.

And now, after this inquiry into the physiological explanations which, I conceive, may be offered of the various phenomena presented by the different classes of patients of which I have been speaking, I think I may be more clearly understood if I do not adhere so strictly to the more or less artificial classification of persons suffering from defective powers of expression into the four principal divisions—*Amnesia*, *Aphasia*, *Aphemia*, and *Agraphia*. These divisions were adopted for the sake of simplicity, and cases have been ranged under each of them, not because such classification was inevitable, but because, looking at them in their broad characteristics (and if they must be forced into one or other of these divisions) that division was selected which the case seemed most to illustrate. Now, however, I think I may venture to increase the number of these

¹ 'Dublin Quart. Journ. of Med. Science.'

divisions without fear of confusing the reader, and I accordingly suggest the following eight groups of symptoms as more natural groups, under one or other of which most of the actual, or possible, cases can or may be ranged. Between the first group and the condition of health the transition is easy :—

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|--|---|--|
| <i>Amnesic Defects.</i> | { | 1. An amnesic defect in speaking, but power of writing preserved : <i>e.g.</i> Case of Bouillaud, p. 22, and of Dr. Oshorn, p. 21.
2. An amnesic defect in writing, but power of speaking preserved : <i>e.g.</i> Case recorded by myself, p. 26.
3. An amnesic defect both in speaking and in writing : <i>e.g.</i> Case of Dr. Banks, p. 7, and of Dr. Jackson, p. 24. |
| <i>Mixed Amnesic and Ataxic Defects.</i> | { | 4. An amnesic defect in speaking, with loss of power of writing : <i>e.g.</i> Case of Dr. Wm. Ogle, p. 24.
5. An amnesic defect in writing, with loss of power of speaking : <i>e.g.</i> Case of Trousseau, p. 19. |
| <i>Ataxic Defects.</i> | { | 6. Loss of power of speaking, but power of writing preserved : <i>e.g.</i> Case of Trousseau, p. 20.
7. Loss of power of writing, but power of speaking preserved. I have found no pure case of this kind yet on record, and the nearest approximation I have met with was presented by the case alluded to in <i>note 1</i> , p. 43.
8. Loss of power both of speaking and of writing : <i>e.g.</i> Case of Trousseau, p. 17, &c. |

It will be seen that groups 6, 7, and 8 correspond, in the strict sense, with the conditions which I name *Aphemia*, *Agraphia*, and *Aphasia*. The cases illustrating the 1st group I included, in the body of the paper, under the heading *Aphemia*, those illustrating the 2nd, 3rd, and 4th groups (with the exception of the case of Dr. Banks), under the heading *Agraphia*, and those illustrating the 5th group would generally be ranged under the heading *Aphasia*. I look upon the classification first adopted as one suitable for clinical purposes ; but that which I have given above is interesting rather as a scientific analysis.

ABILITY TO ARTICULATE IMPAIRED.

4 and 5.—Referring, now, to the table given at p. 3, it will be seen that the only other forms of “loss of speech” that I have to consider are those in which the *ability to articulate is impaired*. Many of these, indeed, can scarcely be considered as cases of loss of speech, they are rather cases in which different degrees of difficulty of articulation are met with. In these we have no necessary mental defects, and except in cases where hemiplegia of the right side exists, the individual is able to write, and express himself in

writing perfectly. I shall allude to these defects only in a very few words, as they do not present many difficulties, and their nature is generally well appreciated. In all the cases the difficulty in articulating is associated, also, with more or less difficulty of *deglutition*. They are distinguished, also, by the fact that the utterance generally, if any be possible, is more or less thick and indistinct, thus differing altogether from what we have met with in the amnesic and ataxic defects just described, where, if the patient could utter words at all, they were articulated as clearly as possible. In the cases coming under these classes there may be difficulty of articulation alone, manifesting itself by different degrees of thickness of utterance, impaired power of moving the tongue, and difficulty of deglutition; or these impediments may be associated also with amnesic or ataxic defects of speech. When they co-exist these different conditions have to be discriminated. When the difficulty of articulation is slight, it often passes off completely in the course of a week or ten days, much in the same way as a slight facial paralysis may do, if the hemiplegia results from a lesion of some portion of one of the hemispheres or corpora striata. But in other cases the implication of the seventh and ninth nerves is much more marked from the commencement, and lasts a much longer time. This is often the case where the paralyzing lesion occurs in the *pons Varolii*. And almost total loss of speech may be met with in connection with disease of the *pons Varolii*, occasionally without hemiplegic symptoms, though usually with paralysis of a marked kind. As an instance of the former kind, I will quote a case which has been recorded by Dr. Wilks in his most valuable paper "On the Pathology of Nervous Diseases."¹

Disease of pons: loss of speech.—A lady fell in a so-called fit during dinner. She was taken up speechless and put to bed. She lay with her mouth open and with the saliva running from it, and she was *unable to swallow or to speak*. There appeared to be no paralysis of her limbs, and from her gestures and expression there was every reason to believe that she was perfectly sensible. She was soon able to leave her bed, and recovered her usual health, but *she never lost the paralysis of the tongue and palate*. She wrote down all her wants on a slate. *She swallowed with difficulty*, and the saliva was continually flowing from her mouth; but she was able to walk three or four miles a day, and was accustomed to join in a game of cards. About two years after the first attack she had another apoplectic fit, in which she died. On post-mortem examination there was found to be a great amount of disease of the cerebral vessels; much blood, which had escaped from the pons, was effused at the base. Within the pons there was an old brownish cyst. The central ganglia were healthy.

Of course it is possible that this case might have been mistaken by an inexperienced person for a case of *Aphemia*, but the paralysis of the tongue and palate and the difficulty in swallowing really pointed most significantly to the seat of the lesion. I will now give the par-

¹ 'Guy's Hospital Reports,' 1867.

ticulars of a case which has recently come under my own care as an out-patient at the National Hospital for the Paralysed and Epileptic, in which extreme difficulty of articulation was associated with well-marked and peculiar paralytic symptoms, such as induced me to diagnose a disease of the pons varolii. The history was obtained from the patient himself and from his son, both of whom were very intelligent.

J. W., æt. 54, married, and the father of six children, a plumber, but never had had lead colic or lead palsy; never had syphilis or rheumatic fever; heart healthy. About six months ago (end of last May) he began to feel pain in front of head and left side of body, coming on at intervals, for about two or three weeks. During some time, also, he was unable to taste his food properly. One day, whilst at work, he suddenly found he could not use left hand at all, so that he gave up working, and went home (which was close at hand). In about ten minutes he is said to have become completely paralysed on both sides of the body, whilst his face was drawn to the right side. This was attended by no convulsions, and even no loss of consciousness, but he found himself unable to speak or utter a single articulate sound. This condition of general paralysis having lasted one month, he then gradually began to gain power over the right side. During the first three weeks he seemed to be quite deaf, but during this time he could understand perfectly what was written for him on a slate. After this time he gradually regained his power of hearing, and became also able to utter single words when asking for food. Even at the end of the first month (whilst still unable to speak) he could write answers well to questions concerning his business, only rarely having any difficulty in recollecting words. He gradually improved in his power of articulating during the second month, though his voice was still muffled: and ever since he has spoken indistinctly and in a low voice, though with no difficulty in finding words so long as he is not excited. The sight of the left eye was much impaired at first, and still continues bad. The sense of taste was also lost at first, and he has not yet regained it on the left side. Sense of smell on the left side is also much impaired. *During the first month he could not move his tongue at all out of his mouth, and had very great difficulty in swallowing. Even still is obliged to have his food cut up into very small pieces.* At, and immediately after, the time of attack it was found that he was extremely sensitive, and unable to bear the slightest touch without pain on the left side of the face, the left arm, and the left half of chest and abdomen; but over the left leg the sensibility seemed altogether lost. The sensibility of the right side of the body was natural. This state of things has continued, with very little change, ever since; but during this last two months he has been regaining sensibility on the inner side of the thigh and leg. He now complains of constant, though exacerbating, pain over the whole of the left side of head. The whole left side of the body has generally felt colder than the right.

Having begun to regain power over the right side after the first month, by the end of the second this was completely restored. Soon after this he began to gain a little power in the left leg, which has since slowly improved; now can walk about one quarter of a mile with aid of stick, dragging left foot along the ground. Within the last week or so has been gaining some slight power over the muscles of the left shoulder, but still cannot move his fingers in the least. During whole time of illness has passed evacuations naturally. He very frequently cries and sobs violently; rarely laughs; this from first, though increased of late. Appetite good, but sleeps badly, being very restless.

This case is an important one in many ways. It affords, in the

first place, a good instance of the kind of loss of speech which is met with in disease of the pons Varolii, showing how it is associated with extreme difficulty in deglutition, and gradually gives place to a condition in which mere difficulty of articulation becomes a most unmistakable feature. The fact of the paralysis for a time being bilateral, of the grave and persistent modifications of sensibility on the left side of the body, as well as the existence of deafness and the impairment of the sense of taste, taken together with the difficulty in articulation and deglutition, present a set of symptoms pointing almost indubitably to a lesion of the pons Varolii. The paralysis of the face in these cases is often on the side, opposite to the paralysis of the body, but it is by no means invariably so, since the lesion may be principally in the lower half of the pons and affect the root of the facial after its decussation, and just before its emergence from that part. Convulsions, also, and loss of consciousness, which are such frequent accompaniments of damage to the pons Varolii, do not occur at all in a considerable number of cases—the presence or absence of these depends much upon the mode and extent of damage inflicted upon this most important part of the brain.

6. The cases included under this class of *glosso-laryngeal* or *glosso-labio-pharyngeal* paralysis present characters so distinct that, when the observer is aware of their existence, he is not likely to confound them with others. The slowly commencing difficulty of articulation and difficulty of deglutition set in, perhaps, at first without paralysis of limbs or wasting of muscles, though after a time the latter, at least, rarely fails to show itself, especially in one or both of the upper extremities. But whilst the difficulty of articulation and of deglutition may advance to such an extreme degree that the patient can scarcely utter even a sound or swallow a mouthful of fluid without danger of suffocation, the mental powers often continue quite unimpaired, and the person may be able to express his or her thoughts perfectly in writing; for in this affection we have a paralysis only of certain motor nerves taking origin from the medulla oblongata, accompanied by more or less of the muscular wasting to which I have previously alluded. The paralytic symptoms are due to an impairment of function, to various degrees, and in various combinations in different cases, of the hypoglossal, the spinal accessory, part of the vagus, and part of the facial nerves.

Various local diseases of the larynx itself produce *Aphonia*, and thereby induce a voiceless, though not necessarily a speechless condition. Such states may be occasioned by tumours of various kinds, stretching or pressing upon the recurrent laryngeal or motor nerves of the larynx, or owing to the growth of tumours from the vocal cords, and other chronic diseases of the larynx. Patients suffering in this way can generally make themselves understood by a faint and more or less indistinct whispered articulation. A consideration of these

affections does not fall within the scope of the present paper, and are only now alluded to for the sake of reminding the reader that such mere voiceless conditions must on no account be confounded with any of the various forms of 'loss of speech' due to cerebral disease.

